Government of Canada | Gouvernement du Canada

Agriculture Canada
Canadian Agriculture Library
Bibliothèque canadienne de l'agriculture
Ottawa K1A 0C5
MAR 14 1996
c 3

1996 1997 1998 1999

Agriculture and Agri-Food Canada's Action Plan

Science and Technology for the New Century

2000 2001 2002 2003

2004 2005 2006 2007

2008 2009 2010 2011

2012 2013 2014 2015

2016 2017 2018 2019

2021 2022 2023

30.4
212
0-1919
1996
c.3

Canada

Digitized by the Internet Archive
in 2012 with funding from
Agriculture and Agri-Food Canada – Agriculture et Agroalimentaire Canada

http://www.archive.org/details/sciencetechnolog00cana

Government of Canada | Gouvernement du Canada

Agriculture and Agri-Food Canada's Action Plan

Science and Technology for the New Century

Agriculture and Agri-Food Canada
Publication 1919/B
Available from
Corporate Services Branch
Agriculture and Agri-Food Canada
OTTAWA (Ontario)
K1A 0C7
Tel : (613) 759-6626

© Minister of Supply and Services Canada 1996
Cat. No. A22-164/1996
ISBN 0-662-62326-6
Printed 1996

Minister's Message

Canadians enjoy an abundant food supply that is safe and of high quality thanks, in large measure, to research and development. Research has given us new crops and animals that prosper under Canada's unique climate and soil conditions. It has also given producers the weapons to combat an ever-changing range of pests that threaten the viability of the agri-food sector.

Generating new knowledge and technology will be a critical factor in determining Canada's future success in markets around the world. Never before has it been more urgent for us, as a nation, to invest our scarce resources wisely in research that will give us the tools to compete in the global economy.

The federal government recognizes the important role we have in helping the Canadian agri-food industry secure its competitive position and take advantage of opportunities that are emerging. But the government cannot act alone. The success of the Canadian agri-food industry depends on the participation of industry partners, both in establishing market-driven R&D priorities and transferring the technology.

For this reason, we have created the Matching Investment Initiative. The goal of this initiative is to encourage further industry investment in areas where federal and industry research priorities intersect by providing matching contributions to collaborative research projects. In this way, we can ensure the relevance of our research and development to the industry and enhance our technology transfer efforts by, in effect, pre-selling the technology. Closer co-operation will strengthen the linkages between market needs and federal labs.

Government funding for the Matching Investment Initiative began in 1995-96. Federal contributions could reach $35.8 million by the year 2000. If fully matched by industry, these funds could raise the level of agri-food R&D in Canada by over $70 million by the turn of the century.

As Minister of Agriculture and Agri-Food, I am excited by the prospects of working even more closely with the industry over the coming years to produce the knowledge and technology Canada needs to ensure a prosperous future for this vital sector.

Table of Contents

1. Minister's Message i

2. Objectives and Goals 1

3. Current Activities and Future S & T Directions 3

3.1 Increasing the effectiveness of federally supported research and training 3

3.2 Capturing the benefits of partnership 3

3.3 Emphasizing preventative approaches and sustainable development 4

3.4 Adopting policies, practices and regulatory approaches that encourage innovation 5

3.5 Extending information networks — the infrastructure of the knowledge economy 6

3.6 Strengthening international science and technology linkages 6

3.7 Promoting a stronger science culture 7

3.8 New market opportunities 7

3.9 Study Management System 7

4. Conclusion 8

2. Objectives and Goals

By developing and transferring new technology, Agriculture and Agri-Food Canada (AAFC) strives to improve the on-going competitiveness of the Canadian agriculture and food sector. AAFC focuses on research of national significance that is valuable to the country, but which the private sector could not provide profitably working alone. Our researchers do not compete with the private sector in areas where they have an interest and capability to do the R&D. Rather, we collaborate to create wealth where strengths are complementary and there is a need to share risk.

Although research in AAFC creates new scientific knowledge and contributes to the quality of life, the work is directed at supporting the industry's competitive position in relation to:

- Price – reducing costs of producing and processing food and nonfood products
- Product – improving quality and safety of food products
- Place – advancing environmental practices that sustain agricultural production in the long term
- Promotion – transferring technology.

The department's R&D clients are the users of the concepts, data, products, and processes it develops. These clients include farmers, food processors, agri-businesses, consumers, consultants, other federal departments, provincial governments, and universities. Many of these partners co-fund work with the department and act as partners in technology transfer.

Research in the department is organized into four distinct areas of business. These together constitute a system — the food chain:

- Resources – health of our soil, water, climate and genetic material
- Crops – safety (protection from disease)
- Animals – welfare, manure disposal, nutrition and reproduction
- Food – safety, nutrition and quality, including nonfood uses of agricultural products.

In September 1994, the Honourable Ralph Goodale appeared before the Senate and House of Commons Committees on Agriculture and Agri-Food to outline the government's vision for the sector. The Minister described the vision as follows:

The fundamental reality is the marketplace. Canada must produce what the world wants to buy. We must do it cost-effectively. We must diversify. We must build strategic alliances internally and internationally.

Research and development in the department supports this.

PRODUCT LINES, PRODUCTS, AND CLIENTS

Product line	Examples	Clients
Services and technologies to conserve plant, animal, and microbial genetic resources, as well as soil, water, and air	Crop-specific genebanks located where a crop is of local economic importance (e.g., cereal genebank in Winnipeg, potato germplasm in Fredericton)	farmers agri-business
	Crop-growth and water-usage measurements from satellite data, obtained through participation in an international climatology experiment	governments
Crop varieties and production and protection systems from traditional and nontraditional techniques and biotechnology	New soybean varieties for cooler climates and for overseas specialty markets	farmers processors
	A predator mite resistant to pyrethroids, to combat pest mites of apples, strawberries, and other crops	agri-business
	A new high-yielding, oil-bearing, miniature sunflower for shorter seasons, requiring no specialized harvesting equipment, now grown commercially	governments foreign buyers
Animal production systems from traditional and nontraditional techniques and biotechnology	A cattle electrolyte supplement, now commercially available, to reduce weight loss and improve meat quality of transported beef cattle	farmers processors
	Improvements in the nutritive qualities of feed rations,through the study of naturally occurring microorganisms in the digestive system	agri-business
	Refinement of a diagnostic test for the gene implicated in the pale, soft, and exudative condition of pork, now being used by industry to survey carriers in purebred swine stocks	
Food and nonfood products, processes, and techniques	Packaging technologies including edible films and coatings, modified atmosphere packaging, and microflora technology, to reduce packaging waste and increase shelf life	farmers processors agri-business
	Technology for continuous, mechanized production of ricotta cheese	government
	Technologies for producing natural food ingredients through genetic engineering and biomass production	foreign buyers

3. Current Activities and Future S & T Directions

3.1 Increasing the effectiveness of federally supported research and training

AAFC focuses on long-term research aimed at ensuring the safety and security of Canada's food supply — the kind of research that cannot be undertaken profitably by the industry. The department also works with increasing industry collaboration on research aimed at delivering innovative technologies, especially in the value-added area, to help improve the industry's competitive position.

Main Estimate figures for 1995-96 for research and development spending by AAFC are forecast to be $276 million. This amount includes funding for the first year of the Matching Investment Initiative. (See 3.2)

In determining where to invest federal research dollars, the program review provided the criteria against which we measured our programs. Foremost among our considerations were:

- the need to deliver the core role of protecting the safety of the resource base, crops, animals and food in Canada
- a view to building on already existing consolidation of research facilities to increase efficiency
- the determination of which programs were location independent, meaning research that could be purchased elsewhere and adapted to conditions in this country
- the determination of the relative capability of sectors of the agri-food industry to undertake more of their own near-market research needs
- the need to assess the nonreplacement of older facilities.

As a result of the Program Review, from 300 to 400 positions will be transferred among research centres to create national centres, each with a critical mass of expertise. Seven smaller facilities will be phased out and closed over the next two years: La Pocatière, Quebec; L'Assomption, Quebec; Smithfield, Ontario; Thunder Bay, Ontario; Regina, Saskatchewan; Vegreville, Alberta; and Prince George, British Columbia.

In the short term, AAFC will concentrate on retraining and relocating research staff affected by program cutbacks and consolidations. However, in the long term, the department will be able to hire some staff under different options so that new knowledge and skills will continue to be brought to bear on federal agri-food research.

The new Study Management System, described in section 4.2, will strengthen the department's capability to assess the impact of its programs in several areas, such as competitiveness and the environment.

3.2 Capturing the benefits of partnership

While undertaking this research that is fundamental to Canada's food security, we must also encourage more private-sector research and development, and facilitate faster technology transfer in order to generate wealth in a sustainable manner and to create jobs.

The Matching Investment Initiative has the potential to address these issues by encouraging industry investment and pre-selling our new technologies. The objective of this initiative is to ensure that our research will be linked closely to industry partners and their market needs.

The government announced in the February 1995 budget that it will fund the Matching Investment Initiative, which could receive up to

$35 million a year in federal money by the year 2000. The funding for this initiative is available for matching dollars from industry partners to carry out collaborative research projects at Agriculture and Agri-Food Canada research centres.

The initiative is aimed at helping maintain and enhance research and development as an essential priority in Canada. In 1995-96, $12 million was available to match funding from the industry. Over the coming years, an increasing part of the funding for research will be allocated under the Matching Investment Initiative. By the year 2000, the fund will reach $35 million.

The Matching Investment Initiative is further increased through the Adaptation and Rural Development Fund if there is sufficient industry demand.

The upfront involvement of private investors in our agri-food research will speed up the transfer of new technology to those who can most benefit from it.

Many projects under the initiative are already under way:

- Researchers in Charlottetown are working with the potato industry to combat late blight disease.
- Fredericton researchers are looking with the Atlantic beef industry at optimal feed mixes of grass and legume silage.
- In Lennoxville, scientists are working with the pork industry to identify genes responsible for desirable meat characteristics.
- Researchers at Delhi are looking at a new crop's potential to provide a natural sweetener
- Brandon researchers are working with crop protection companies to reduce herbicide rates for quackgrass control.
- New canola hybrids are being developed in Saskatoon.

In the context of the Matching Investment Initiative and other collaborative arrangements, the department welcomes industry scientists to work out of its labs. In this way, industry can avoid the overhead costs associated with research and the department may develop strong new links to the market.

3.3 Emphasizing preventative approaches and sustainable development

Canada needs a sensitive and sensible balance among social, economic and environmental considerations founded on enhancing our resource base, maintaining surrounding ecosystems and developing, adopting and marketing new technologies to protect the environment.

The maintenance of a safe and secure food supply is really the foundation on which everything else rests. Food safety has been, and must continue to be, a priority in and for Canada. Our reputation for safety and quality is vital to our domestic consumers and it's a critical advantage in the international marketplace. As a judicious and low user of pesticides and fertilizers, our environmental stewardship could become a unique new Canadian export opportunity.

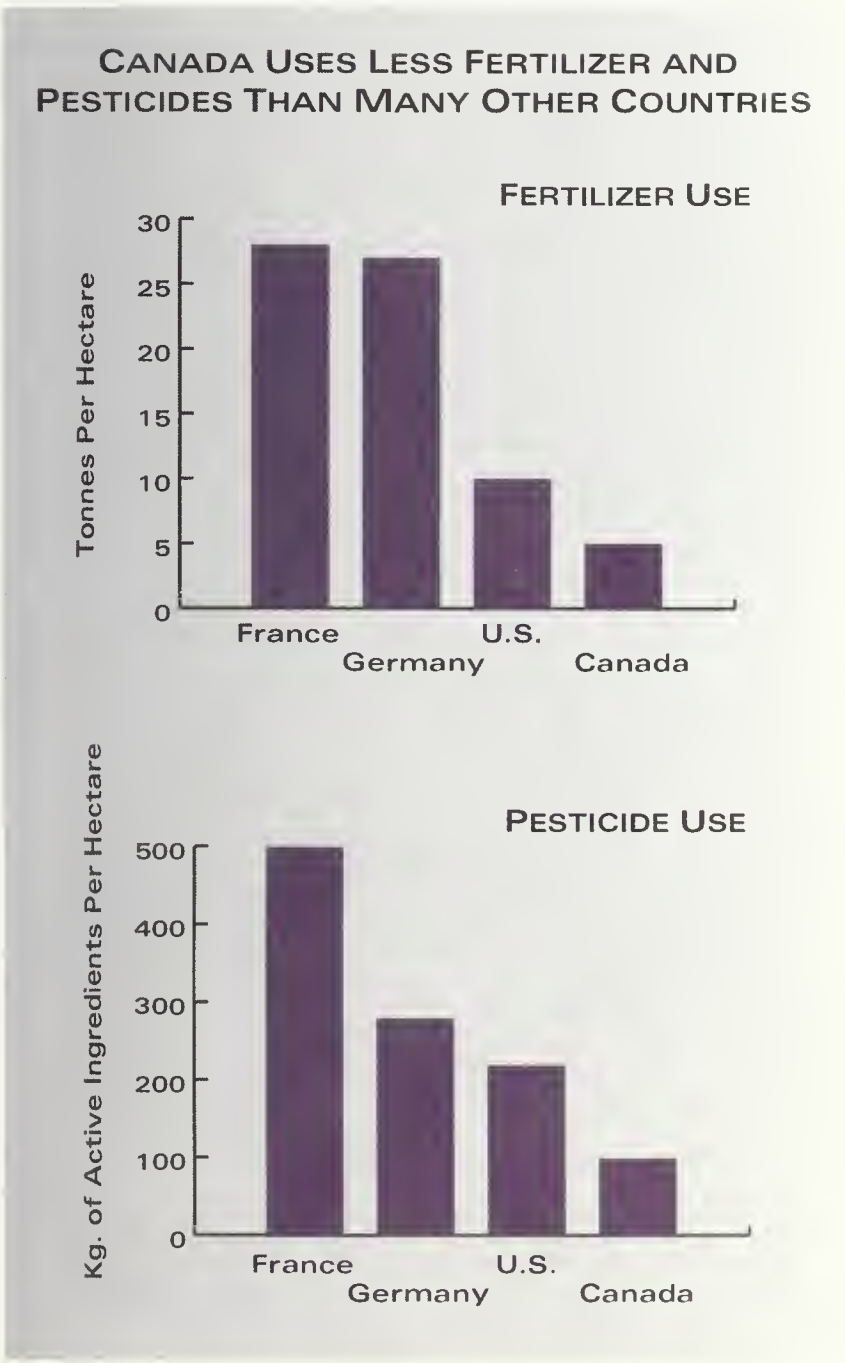
As Minister Goodale has noted, health and safety of the food supply is a prerequisite for the agri-food industry to gain entry to markets both domestically and internationally. Agriculture and Agri-Food Canada assists industry to gain entry to markets through core mission-oriented R&D which aims to:

- Protect environmental health (e.g. crops for rotations, safety of soil)
- Identify foreign pest threats (e.g.identify a new crop disease) and control domestic crop threats (e.g. breed resistance to a crop disease, safety of crops)

- Contribute to safety of food (e.g. reduce the threat from toxins, safety of food)

Relating directly to preventative approaches, 15 to 20 new crop varieties of cereals, oilseeds, forages and specialty crops will be released each year to the turn of the century with improved resistance to diseases, pests and environmental stresses.

Animal gene mapping will help to identify specific sites governing disease resistance. This information will be invaluable in developing selection and breeding protocols.

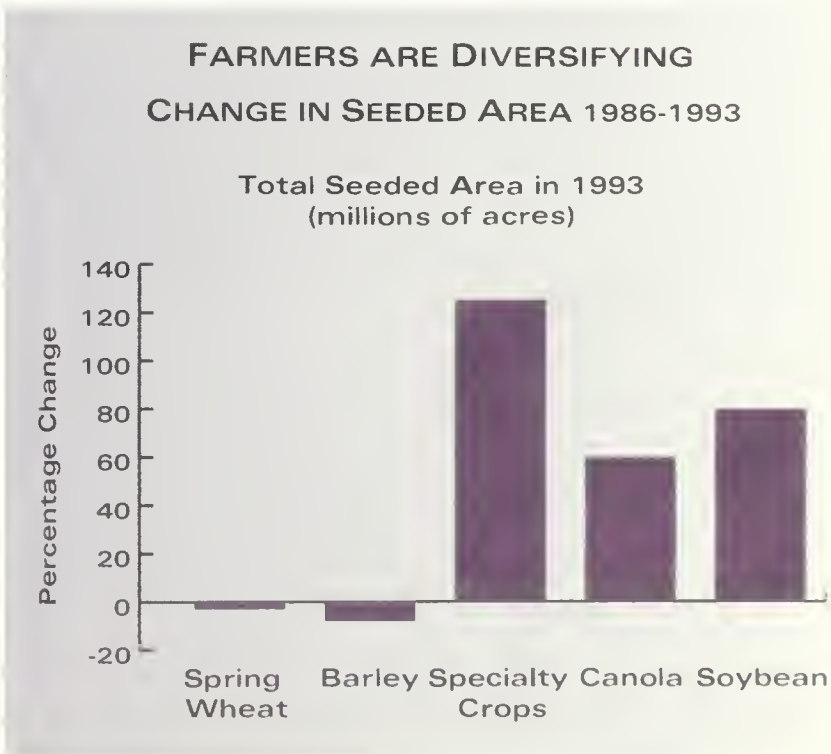


3.4 ADOPTING POLICIES, PRACTICES AND REGULATORY APPROACHES THAT ENCOURAGE INNOVATION

Innovation can be fostered in Canada's agri-food industry if farmers and processors are provided with new options to take advantage of emerging opportunities.

A central issue for AAFC is the diversification of agriculture and food, especially in Western Canada. The excellent work done in areas such as field peas, sunola, spices, and most recently canola-quality mustard, are examples of research oriented to this priority.

Adding value to our production either as food or as nonfood industrial products is also a growing departmental interest. Once we have ensured that Canada has food which is of value (e.g. a crop which is free of significant plant diseases, is free of any threat to human health and is safe from an environmental point of view), researchers can then look for new ways to "add value" to it at every step in the food chain. Research and technology are seen as tools to add value to existing products or to create completely new products.



Increased emphasis on collaboration through the Matching Investment Initiative is enhancing technology transfer while flexible approaches to intellectual property and licensing is making it easier for clients to do business with AAFC. The new Business Initiatives Office was created by the department to help get its researchers working even more effectively with industry.

3.5 Extending information networks — the infrastructure of the knowledge economy

Research undertaken by AAFC is being consolidated at selected national centres across Canada. Each of the 18 centres in the department's Research Branch will have a specialized focus of national importance, reflecting the industry strengths of the region in which it is located. Consolidating research programs focuses a critical mass of scientific expertise in a smaller number of strategically important centres and reduces administrative overhead. Names of centres are being changed so that clients can more readily discern their areas of expertise.

The department is also fostering alliances with the agri-food industry by establishing research networks with a central focus at the key relevant centre. Three hub and spoke systems are under development across the country to help improve communications among sister centres.

The hub of the Dairy Research Network has been established at the Dairy and Swine Research and Development Centre in Quebec. The Clonal Gene Bank Network, dedicated to preserving fruit crops, will be at the Harrow Research Centre. The Summerland Research Centre serves as the hub of the Tree-Fruit Research Network.

R & D in the department is also undertaken at research establishments across the country in the Food Production and Inspection Branch. These labs focus on safety and quality in animals, plants and their products.

The Inventory of Canadian Agri-Food Research (ICAR) provides information on more than 4,000 R&D agri-food projects from federal, provincial, university and private labs. This database can be accessed internationally.

3.6 Strengthening international science and technology linkages

AAFC is focussing on a few targeted international partnerships that help us to acquire new scientific and technical knowledge that we can apply to the Canadian agri-food industry. These partnerships are framed through such mechanisms as memoranda of understanding, science and technology agreements, and aid-funded projects. MOUs have been signed with Holland and France, and opportunities for strengthening collaboration with the United States Department of Agriculture are being explored.

For illustration, under the MOU with France's agri-food research organization, research centres in France and Canada with similar focus have been twinned, specific collaborative projects are under way, and scientists are involved in exchange programs.

In addition to ICAR described in the preceding section, AAFC utilizes several other databases. The World Bank of Licensable Technology is a database that has worldwide recognition as a marketing source for technologies. The Canadian franchise is held by the Canadian Industrial Innovation Centre in Waterloo, Ontario. AAFC technologies are contained on this database.

The Internet is providing new and exciting opportunities for exchanges among the international science community and for providing information to industry. In addition to the AAFC web site that contains research information, many research centres have established their own home pages.

3.7 Promoting a stronger science culture

AAFC arranges for displays and distributes promotional material at international, national and regional industry exhibitions and conferences. They highlight new technologies that increase the agri-food industry's competitiveness at home and abroad. In addition, research centres across the country regularly hold field days for industry clients and the general public to inform them of their respective activities.

Individual scientists are also active in school programs such as science fairs.

3.8 New market opportunities

Along with increased competition for domestic markets, there are new market opportunities, especially abroad. Through research, the Canadian agri-food industry can win a strong competitive edge, mainly in the areas of product safety and quality, and value-added products.

Canada has set a target of increasing agri-food exports to $20 billion annually by the year 2000. Attaining this goal will require a significant contribution by federal researchers to provide new and improved products, more diversified products — especially those that add value at each step, from farmer to consumer -– along with better technologies for packaging, preservation and distribution. Increased efforts in these areas are encouraged by the Trade Opportunities Strategies Committee and the National Advisory Board on Science and Technology.

The interest in nonfood uses of agricultural products continues to grow. High value fractions of products such as grains, eggs and peas, pharmaceutical products, fuels and new materials are just a few of the new products emerging from the research labs of the world. As the agricultural horizon changes, these high value products provide an opportunity to create jobs and economic growth.

3.9 Study Management System

To make the most of the funding available to the department, we are working on a systematic process to apply when considering research study expenditures. The process will take into consideration questions such as: Is it the role of the federal state to do this work? What is the probability of success? What are the benefits? What are the costs?

The new Study Management System will provide us with a consistent approach to study selection. It should help us achieve the following:

- optimize research investments by developing a standard set of tools to evaluate study proposals
- ensure new technologies have a competitive advantage over existing technologies
- ensure early planning for technology transfer and adoption.

The department will introduce by the next fiscal year this new system for managing research studies, including a system for making investment decisions in research within all our research centres. The study selection process will also reflect the technology development aspects. The new process may help us to identify potential partners for our research and to encourage their early involvement in technology development, transfer and risk sharing. It will also increase awareness of the need to protect these technologies.

4. Conclusion

Research is basic to our ability to capture new markets. Value-added products, new cost-saving technology, nonfood products from agricultural commodities and innovative approaches such as biotechnology are all the result of a strong research infrastructure. Research is also central to safe food and a healthy environment.

The federal government has a critical role to play in helping to ensure the Canadian agri-food industry is competitive and can take advantage of emerging market opportunities. But the government cannot, and should not, act alone. The success of the Canadian agri-food industry depends on all industry partners, both in establishing market-driven R&D priorities and transferring the technology.

The Matching Investment Initiative will be an important means to achieve this success. The research supported through this initiative will produce more targeted results faster which will mean better financial returns for farmers, new job opportunities and a more competitive position for the agri-food industry in global markets.